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ABSTRACT

This discussion on spelling and phonics focuses on beginning reading vocabulary (phonology and graphemics of high utility words), factors in word perception (their recognition in teaching word perception skills), premises and principles of phonics (their relation to curriculum content and to methods), phonic rules or spelling patterns (their validity and hazards), and letter names (knowledge of letternames as one predictor of readiness for reading and fact or myth regarding value or learning). Appended is a bibliography which can serve as a springboard for educators and researchers committed to the serious study of orthography as a roadblock to reading, an index to the diversity of problems to be solved before commitment to an initial learning medium or to spelling reform, and a survey of opinions and facts regarding spellings as representations of language. (HOD)

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SPELLING AND PHONICS [*]

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CS 002 547

Preview

Everyone knows about phonics. And everyone knows about spelling. This is especially true of journalists and parents -- and some phonic zealots.

Yes, almost everyone knows that ABOUT phonics and spelling, but do they understand the relationship between spelling and phonics? 'Tis said that a little knowledge is dangerous. Then some wise acre asked, "Who knows enough NOT to be dangerous?"

Although linguists have contributed substantially to one basis of reading instruction, they do not know enough about phonology and grammar to settle "easy" queries about a phonological syllable. Nor do they agree on an inventory of vowel phonemes basic to phonograms. Equally important, their attempts to write basic readers have violated their own premises, resulting in highly debatable materials.

Then, too, psychologists have made significant contributions to the semantic and pragmatic bases of reading instruction and to the psychology of learning, especially motivation, perception, and cognition.

As a result a new breed of psychologist, called psycholinguist, has appeared on the educational scene to question methodology and to offer new perspectives. Yet, psychologists, like the linguists, are not prepared to offer educational prescriptions.

Linguistics became a fad during the 1960's -- a new shibboleth for some publishers and some authors to exploit. The psychology of learning, another basis of reading instruction, was renamed *psycholinguistics* when applied to verbal learning. This, too, became a vogue, seized upon by some publishers and some authors intent on exploitation of the "reading" market. The *sociology* of reading, a legitimate concern of serious students of integration, appears to be well on the way to becoming another password in the 1970's. As educationists become increasingly aware of our spelling system and the broad meaning of the alphabetic principle, orthography appears on the horizon as another concept to be exploited -- and discarded when one-facet programs are exposed. But these and other bases of reading instruction require a depth of understanding and an ability to translate them into the total program for which few are willing or able to pay the cost in terms of scholarship.

Americans -- including educationists, psychologists, linguists -- love slogans and catch phrases. They invent them to sell ideas and products; they live by them. Phonics and spelling are no exceptions to sloganeering.

More recently orthography, the study of spelling systems, has been reincarnated. Scholars in this discipline have caused educators to take a second, long hard look at the medium with which all educationists deal: the writing system. They have raised two issues:

A. How well do spellings predict (i.e., signal) pronunciation?

B. How well do spellings signal morphology -- the inflection, derivation, and compounding of words?

Orthographers, therefore, are concerned with the phonemic and/or morphophonemic basis of spelling. How close a fit between phonemes and spellings (phonograms) is necessary and can be justified? How close a fit between morphemes and spellings is necessary and can be justified? More recently this question has become increasingly relevant: For beginners, is it necessary for an initial learning medium (i.l.m: e.g., i.t.a. or WES) to signal more than phonemes? That is, is morphology crucial for the beginner?

Recently, orthographers have pinpointed the spelling system as a major roadblock for both beginners in reading and adults learning English as a second language. While it is a truism to declare that there are many causes of reading disabilities, the spelling system merits consideration, deliberation, and investigation via an interdisciplinary approach, and *subsequent* action by educationists.

Articles on facets of orthography have appeared mostly in five educational magazines: *Elementary English*, *Harvard Educational Review*, *Reading Improvement*, *The Reading Teacher*, and *Reading Research Quarterly*. In addition to these educational magazines, other periodicals on language and orthography are available for teachers and researchers concerned with the medium:

Journal of Verbal Learning and Verbal Behavior, published by Academic Press, Inc., 111 Fifth Avenue, New York, N. Y. 10003

Language, published by the Linguistic Society of America, Waverly Press, Baltimore, Md. 21202

Spelling Progress Bulletin (a periodical on initial teaching alphabets and spelling reform) published by Newell W. Tune, 5848 Alcove Avenue, North Hollywood, California 91607

Visible Language, The Journal for Research
on the Visual Media of Language Expansion.
(Formerly *The Journal of Typographic Research*),
published by MIT Press, Cambridge, Mass. 02142

'Tis said that fish will be the last to discover water. That birds will be the last to discover air. Likewise, it can be said that those concerned with reading instruction will be the last to discover the medium, or orthographic code or writing system, with which they are dealing everyday.

Crucial to note: scholarship in linguistics, psychology (learning, cognition, perception, motivation), sociology, and orthography do not a so-called reading "specialist" make. Likewise, a reading specialist is not made by appointment or by anointment with lecture courses on reading instruction; nor is this person to be a specialist in one or all the disciplines contributing to the bases of instruction. Instead, the reading "specialist" needs a "working," or pragmatic, indoctrination.

This discussion is organized to spotlight the basic issues in phonics and to direct attention to the many implications of a spelling system that has a loose fit with phonemes and morphemes of language (speech). In brief, these are some, not all, of the CRUCIAL questions:

What special word-perception hazards are inherent in the most commonly used words?

How can awareness of the factors in word perception (e.g., grouping of pronounceable units as bea, ea, eat in beat; closure to insure linguistic or referential meaning, etc.) contribute to an improved methodology?

To what extent is this alphabetic principle applicable to the English spelling system?

Why do phonic rules tend to be self-defeating?

- a. What are the application/exception ratios for vowel and consonant rules?
- b. Why do function words (e.g., *to*-*too*-*two*, *of* /əv/, *when* /hwen, wen/) present special word-perception problems?
- c. How does stress (accent) complicate vowel rules?

What approaches can be made to legitimate phonics instruction?

What are the implications of the issues regarding phonics versus spelling for the preparation of teachers?

What research is needed to standardize letter shapes?

Is *knowledge* of letter names *one* valid predictor of preparation for beginning reading? If so, does *learning* letter names contribute to word-perception skills for beginners?

Is reading a simple decoding process of relating graphemes to phonemes -- of converting writing into the language (speech) code? Stated another way: Is there more to word perception than phonics to "unlock", or identify, unknown words during the on-going reading process?

These questions may be more important:

1. What is the chief purpose of phonics in word identification and re-cognition?

2. What are the limitations of phonics for developing independence in word identification?

3. What are the dimensions of language (speech) which enter into word perception during the on-going process of reading?

a. Is it legitimate to limit word perception, for example, to the relationships between speech sounds and spellings used to represent them?

b. What is the role of intonation, especially phrase stress, in word-perception?

c. What contributions are made to the study of word perception by structural linguists? By transformationalists?

4. What are the dimensions of orthography (spelling system) which enter into word perception during the on-going process of reading?

- a. Phonemic
- b. Morphemic
- c. Morphophonemic
- d. Semantic

5. Is reading a process of recoding via inner speech and of decoding the message via grammatical and semantic rules?

a. Is inner speech (subvocalization) a characteristic of the reading performance of beginners?

b. Is orthographic representation of speech bound to phonemics alone?

c. Is traditional, or conventional, orthography via lexical words adequate for signalling semantic relationships, as in n(a)tion-n(a)tional?

6. Can reading performance of beginners be escalated via a carefully researched writing system, especially a spelling system, which achieves a closer fit to phonology?

a. Is there a significant advantage in one set of letter shapes for both capital (upper case) and small (lower case)? For example, to eliminate the forms G and g?

b. What are the advantages and disadvantages of augmented Roman alphabet, as in i.t.a.? What are the advantages of no-new-letter spellings, as in World English Spelling, especially W.E.S.-i.t.m? Or, some other proposal?

c. What values accrue for a morphophonemic approach to an initial learning medium (i.l.m.)?

Briefly, this presentation deals in some depth with the issues regarding spelling and phonics:

Beginning Reading Vocabulary -- phonology and graphemics of high utility words

Factors in Word Perception -- their recognition in teaching word-perception skills

Premises and principles of phonics -- their relation to curriculum content and to methods

Phonic rules, or spelling patterns -- their validity and hazards (graphotactics)

Letter names -- knowledge of letter names as one predictor of readiness for reading and fact or myth regarding value or learning (letter names)

The appended bibliography serves three purposes:

1. A springboard for educators and researchers committed to the serious study of orthography as a roadblock to reading

2. An index to the diversity of problems to be solved before commitment to an initial learning medium or to spelling reform

3. A survey of opinions and facts regarding spellings (phonograms) as representations of language (speech)

High Frequency Words

What are the commonest words used in communication? In summary, here are some facts regarding the number of different words (types) that account for a given percent, in round numbers, of running words (tokens):

Percent	Number of Types
10	3
25	9 or 10
50	50
60	100
80	500
90	1000

Vocabulary: Phonology and Graphemics

Highly relevant to discussions of phonics, spelling, spelling reform, readability and differentiated instruction are yields of studies of listening, speaking, reading, and writing vocabularies. A rapid survey of evidence on commonly used words reveals significant implications.

Ten Percent: Three Little Words

According to Ernest Horn, *A Basic Writing Vocabulary*, three little words -- *a*, *and*, *the* -- comprise 10 percent of the running words (tokens) used in communication; these three little words are function rather than content words; that is, they have linguistic (syntactic) meaning, not referential meaning. They are commonest not only in the speech of infants and in beginning reading materials, but also in the speech and writing of adults. Furthermore, in propositional speech they usually are unstressed: *a* pronounced /ə/ rather than /'a/, *and* pronounced /ən/, /n/ or /nd/ rather than /'and/, *the* pronounced /*th* / or /*th*ə/ rather than /'*th*ē/. Their use in speech involves primarily suprasegmental (intonational) rather then segmental phonemes. How can phonic (graphotactic), especially vowel "principles" be applied to these commonest words?

Ten Words: Twenty-five Percent

In his *Relativ Frequency of English Speech Sounds* (1922), Godfrey Dewey concurred, in general, that 10 commonest words form over 25% of the total number used. His nine commonest words: *a*, *and*, *the*, *of*, *to*, *in*, *that*, *it*, *is*. The tenth and eleventh words: *I*, *for*.

Much earlier, Leonard P. Ayres in his *Measuring Scale for Ability in Spelling* reported the ten commonest words: *a*, *and*, *the*, *of*, *to*, *in*, *that*, *for*, *you*, *I*.

All of these ten words are classified as function, or syntactic, words. Although only seven per cent of American English lexicon is used to make clear the structure of sentences, lists of commonest words are freighted with function words. Obviously, these words are needed for communication, but they have syntactic meaning (i.e., exist only in language) and are required to signal parts-of-speech, or content words. That is, meaningful communication is not possible when they are used exclusively, but communication depends upon them.

To test this finding, identify a, and, and the in the following quotations:

"The true art of memory is the art of attention." (20%)

"By the time a man can afford to lose a golf ball, he can't hit it that far." (17%)

"An attempt has been made to show how the obtained results might be accommodated within a theoretical framework which is psycholinguistically oriented and which conceptualizes the child as a communication channel of limited capacity." (15%)

"The role of speech recoding in reading has been a topic of interest to psychologists for many years. The phenomenon has been known by many names, including silent speech, inner speech, subvocalization, phonemic recoding, and acoustic recoding. 'Speech recoding' is used in this paper as a generic term for the transformation of printed words into any type of speech based code, whether it be articulatory, acoustic, auditory imagery, or a more abstract code." (10%)

Here are some relevant comments regarding the ten commonest words used in communication:

1. The words *a*, *and*, *the* have been commented on above.

2. The word *of* is respelled /(')əv, ə, 'av) in which the letter *f* represents the sound /v/. Of course, the vowel -- stressed or unstressed -- does not fit the CVC spelling pattern, or short vowel rule.

3. The word *to* is a homonym, also spelled *too* or *two*.

4. The word *in* is a homonym with *inn*.

5. The word *for* is respelled /fər, (')for/ depending on phrase stress.

6. Four words fit the (C)VC spelling pattern, or the short vowel rule. In short, phonic skills may be applied with assurance to 40% of the ten commonest words: *that*, *in*, *it*, *is*.

Why are the commonest words crucial?

First, they are used necessarily in reading materials for beginners. Therefore, they merit special study in terms of spelling.

Second, a preponderance are function words, tending to be unstressed in normal speech. Hence, they create problems in learning word-perception skills because phonic skills usually are developed on isolated word forms which, of course, are stressed.

Third, function words have linguistic rather than referential meaning.

Fourth, the commonest words tend to be irregularly spelled. That is, they are exceptions to phonic, or spelling patterns, introducing special word-perception problems.

Fifty Words: Fifty Percent

In his The Spelling Vocabulary of Personal and Business Letters (1913), Leonard Ayres reported that 50 words (types) made up nearly 50% of all running words (tokens) including the 10 commonest above:

Word	Respelling
the	/t̲h̲ə, t̲h̲ē, ˈt̲h̲ē/
and	/ən(d), (ˈ)an(d)/
to	/tə, tu̇, (ˈ)tü/
of	/(ˈ)əv, ə, ˈäv/
a	/ˈā, ə, (ˈ)ā/
in	/(ˈ)in, ən, n, ˈin/
it	/(ˈ)it, ət, ˈit/
for	/fər, (ˈ)fȯr/
that	/(ˈ)t̲h̲at, t̲h̲ət, ˈt̲h̲at/
is	/(ˈ)iz, əz, z, s/
I	/(ˈ)ī/
you	/(ˈ)yü, yə, yē/
be	/(ˈ)bē/
we	/(ˈ)wē/
have	/(ˈ)hav, (h)əv, v, (ˈ)haf/
your	/yər, (ˈ)yu̇r, (ˈ)yōr/
will	/wəl, (ə)l, (ˈ)wil/

are	/ər, (')är, (')ȧr/
yours	/'yu̇rz, 'yōrz/
not	/(')nät/
as	/əz, (')az/
at	/ət, (')at/
this	/(')this, thəs/
with	/(')with, (')with/
but	/(')bət/
on	/(')ȯn, (')än/
if	/(')if, əf/
do	/(')dü, də/
all	/'ȯl/
so	/(')sō, sə /
me	/(')mē/
very	/'ver-ē/
my	/(')mī, mə/
get	/'get/
from	/(')frəm, (')främ/
our	/(')är, (')au̇r, (')ȧr/
was	/(')wəz, (')wäz/
time	/'tīm/
put	/ 'pu̇t/
can	/kən, 'kan/
one	/'wən, (,)wən

would	/wəd, (ə)d, (')wu̇d/
he	/(')hē, ē/
had	/(')had, (h)əd, d/
go	/'gō/
letter	/'let-r/
been	/(')bin/
when	/(')hwen, wen, (h)wən/
she	/(')shē/
good	/'gu̇d/

The (C)VC spelling pattern, or short vowel rule, fits as, at, can, had, that; get, letter, when; if, is, this, will, with, in, it; not; but. These 17 words account for 34% of the fifty commonest words. But what can be said for the spellings of the consonant boundaries in (wh)en, (th)at, (th)is versus wi(th), i(s) -- a(s), (c)an?

One word fits the (C)VC plus final e, or split digraph vowel rule: time. But have which is pronounced /(')hav, (h)əv; before t , often (')haf/ and, therefore, is a double hazard.

One word, good, has the oo spelling for /u̇/, but the oo spelling also represents /ü/ as in moon.

Eighty-eight percent, or 44 words, are function words: noun markers (e.g., the), phrase markers (e.g., in), clause markers (e.g., if), verb markers (e.g., have), pronouns (e.g., you), conjunctions (e.g., and), intensifiers (e.g., not).

Twelve percent, or 6 words, are content words: class 1, nouns (e.g., letter); class 2, verbs (e.g., go); class 3, adjectives (e.g., good).

The etymology (derivation) of the Ayres list is primarily Old English. Forty-six percent, or 23 words, were different morphologically from the original forms; e.g., have was habban. Seventy-eight percent were derived from Old English; the remainder from Middle English, Old Norse, Old French, and Indo-European. These data are being reported in a subsequent publication.

Furthermore, here are some crucial questions:

How can phonic skills be applied to the words *to*, *I*, *you*, *of*, *have*, *are*, *from*, *for*, *very*, *was*, *put*, *one*, *on*, *would*, *been*, *our*, *your*, *my*—more than 20% of the fifty commonest?

What phonic rule fits *she*, *be*, *he*, *him*? The words *do*, *so*, *go*?

If it is assumed that the commonest words have a very high probability of use in beginning reading materials, then it appears that the teacher -- and the pupil! -- must seek other word-perception skills than phonics. Or, perhaps more important, the teacher needs to give serious consideration to an initial teaching medium beyond irregular conventional spellings.

Here are some relevant statements:

1. A preponderance of commonest words are irregularly spelled; therefore, these words have high frequency use in materials for beginners in reading.

2. Significant differences in capital and lower case letters add to the word-perception confusion, especially for beginners. (This situation is easily corrected.)

3. Significant differences between manuscript and cursive writing contribute to the learner's difficulties in word perception.

4. Significant differences between handwriting and printed add to the learner's dilemma.

Word Perception: Factors

Word perception requires far more than (1) applying so-called phonic rules or spelling pattern sequences and (2) memorizing a list of sight words. In fact, a complex of conditions and factors enter into the process of *automatic* word identification and re-cognition.

1. Readability of material
    a. *Independent* reading level for extensive and study-type activities
    b. *Instructional* reading level for reinforcing motivation, learning new word-perception skills, and developing concepts

2. Awareness of a personal *need* for identifying an unknown part of a word or a spelling pattern

3. *Attention* directed to a need

4. Learning *set*, as a determiner and organizing factor; e.g., hearing syllables in a spoken word before identifying spellings of the syllables

5. *Grouping* (or chunking) pronounceable parts of a monosyllable or the syllables of a lexical word; e.g., *ca*, *a*, or *ap* in *cap* or *lett* in *letter*

6. *Meaning*, structural (e.g., a function word as *then* or *of*) or referential (e.g., the word *hot*)

7. *Contrast*, e.g., the sound patterns of /'sit' and /'sat/ or the spelling patterns of *hat* -- *hate*

8. *Closure*, perceptual and cognitive. For example, identifying the whole word *park* after being told the sound /ȃr, ár/ (except in N. E. United States!) and consummating with cognitive "meaning"

9. *Feedback* from perception of lexical words to speech and during a directed reading activity, from teacher to learner

10. *Application* to other words with the same spelling pattern, and finally to pseudo words

The above are samples of conditions and factors in word perception. Other factors enter into the complex processing of lexical words (e.g., dictionary entries) in isolation and within the intonation (rhythm) patterns of speech.

Phonics: Premises and Principles

Here are some statements of premises and principles which appear to merit serious consideration in an assessment of "spelling and phonics":

1. To a degree, writing represents speech; therefore, one approach to word perception is the study of the relationships between the two; i.e., phonics.

   a. Writing (orthography) as a substitute for speech (language) reflects phonemes (via spellings), intonation (via capital letters, italics, and punctuation), and morphology (via roots, affixes, syllabication, etc.) -- all quite imperfectly.

   b. Monosyllabic words pronounced in isolation always have primary, or strong, stress.

   c. The purpose of phonics is to teach pupils to relate spellings and speech -- not to teach them how to pronounce words (i.e., not to teach speech production).

Phonics is the study of the relationship between graphics (letters, punctuation, spaces, etc.) and phonemes, and teaching the child the "sounds" is not the purpose of phonics instruction. That is, phonics instruction deals with relating the two systems -- language (speech) and writing.

d. Corrective speech is not a significant purpose of phonics instruction.

e. There is scientific evidence to demonstrate that the higher the spelling-to-sound correlation, the more nearly accurately the words are reproduced. (See Eleanor Gibson, *et al* "The Role of Grapheme-Phoneme Correspondence in the Perception of Words.")

f. Graphic signals -- e.g., letters, punctuation, etc. -- have no meaning *per se*.

g. All letters are silent;

Some letters are superfluous letters, as *n* in *column*, *t* in *often*.

h. Letters do not have sounds; writing is VISIBLE language.

i. Learning to read requires the development of reading processes far more complex than word perception.

j. Word-perception skills in the on-going processes of reading function _automatically_, leaving the learner's _one_ mind to decode the message.

k. Application of word-perception skills to nonsense, or pseudo, words is a valid test of learning; e.g., to _lat_ vs _sat_, _doat_ vs _coat_.

l. To escalate reading instruction, there is an immediate need to study word perception at the phoneme-grapheme and higher linguistic and cognitive levels.

m. The concept of "irregular spellings" varies significantly from one researcher to another, ranging from phonemic spellings to morphophonemic spellings.

(1) Phonemic spellings appear to merit the emphasis in beginning reading, but orthography does signal morphology to a degree.

(2) Some linguists (e.g., Bloomfield, Fries) tend to emphasize "code breaking" at the phonemic level in beginning reading via spelling patterns.

2. Phonics and look-and-say (word or sight) "methods" are two different approaches to two different situations: (a) regularly spelled words (e.g., red) and (b) irregularly spelled words (e.g., said, you).

a. The "visual" method -- also called sight, look-and-say and whole-word -- in beginning reading appears to have some validity when the high percentage of irregular spellings of common words is given necessary consideration.

b. The "visual" method is a paired associate learning procedure, but too often it is a tell-the-child-the-word violation of the psychological principles of learning.

c. The "visual-auditory" method --also called phonics -- appears to have validity for regularly spelled words, in the phoneme-grapheme sense rather than the morphophonological sense.

d. The "visual-auditory-kinaesthetic" method -- often called the kinaesthetic -- is syllable phonics which introduces a motor component to reinforce attention (a factor in perception).

e. The "visual-auditory-kinaesthetic-tactile" method -- sometimes called tracing -- also is syllable phonics which introduces at least one additional modality to reinforce attention (a factor in perception).

f. Phonic methods are plural; so are "sight" methods.

(1) Rote memorization; e.g., flash cards

(2) Paired associate learning; e.g., word and picture

3. Spellings of words are often misleading signals of pronunciation.

a. The fact that English dictionaries respell all words is admitted by lexicographers to be an indictment of the English spelling system.

b. Consider these spelling pronunciations on radio and television news programs:

Word	Respelling	Mispronunciation
epitome	/ē-'pit-m-ē/	ep-i-tome
severed	/'sev-rd/	see-veered
temperature	/temp-r-chůr, 'temp-ə-, 'temp-r(-)ə-, -chər/	chər or chůr as 'tə
tournament	/'tůr-nə-ment, 'tər-/	tour-na-ment

c. Both *vowels* and *consonants* are irregularly spelled, but vowel spellings are constrained by a paucity of letters, as in *was*, *again*, *been*.

d. Predicting sound from spelling requires consideration of linguistic-orthographic factors.

(1) Spelling patterns: (C)VC, (C)VC(e), CVVC -- 35% of "common" words, including function words

(2) Syllable stress: *surprise*, *servant*, *purpose*, *announced*, *barometer*, *e(x)ist* versus *e(x)ercise*

(3) Phrase stress: function words; e.g., *and*, *or*, *of*, *a*, *the*, *to*, etc.

(4) Highly irregular spellings: *of*, *one*, *come-some*, *there-where-were*, *what-want*, *laugh*, *who*, *quick*, etc.

(5) Phonotactical rules: *(kn)ow*, *(gn)aw*, *(pn)eumonia*, *(gh)ost* versus *lau(gh)*

(6) Morphemic patterns: e.g., *hat-hats*, *horse-hors(es)*, *mark-marked*, *land-landed*

(7) Morphophonemic spellings: e.g., *hymn-hymnal*

(8) Logograms: +, %, #, $

~~c. Both *vowels* and *consonants* are irregularly spelled, but vowel spellings are constrained by a paucity of letters, as in *was*, *again*, *been*.~~

4. Both phonic and spelling rules for traditional orthography tend to be self-defeating.

a. Rules in phonics tend to be ineffective because exceptions to rules interfere with rather than facilitate independence.

b. Phonic zealots tend to ignore the influence of the melody of language, called intonation, on word perception. For example, *and* is usually unstressed /an/ or /ən/, not /ˈand/ in the stream of speech. Or, consider, *has* as

/ˈhas/ in *He has to do it* versus

/haz/ in *He has a broken arm*.

c. Vowel "rules" are high level generalizations. For example, the rule regarding "short" vowels requires a generalization regarding the *different* sounds in s(a)t, s(e)t, h(i)t, h(o)t, and c(u)t. But what is common to the vowel sounds in these words?

d. Learning phonic generalizations is a questionable approach to word perception.

e. Blending in phonics is a misleading and mysterious mixture of orthographics and phonemics.

f. Teachers do not know phonic generalizations.

g. The attitude of teachers toward language -- with a "monolithic fixation" on correct English -- may cause the child with divergent phonology, grammar and usage to be penalized.

5. Decoding, a term introduced by some linguists and psychologists, is a mythnomer because it is a superficial concept of reading--leading to the same misconceptions entertained by phonic zealots.

a. Decoding -- an often used and misused term -- embraces (a) decoding writing into speech and (b) decoding the message.

b. Decoding requires both perceptual and cognitive closure to insure comprehension.

6. There have been few innovations in the teaching of phonics since Ickelsamer introduced the idea during the sixteenth century.

a. Awareness of word (lexeme) structure can be developed on regularly spelled words (e.g., *hat* vs *said*) and syllables (e.g., *(sat)isfy*) via a phonics countdown that emphasizes pronounceable units (e.g., *ca*, *a*, or *ap* of *cap*).

b. The approach to phonics by Leonard Bloomfield and his disciple, Charles Fries, like the approaches in the Aldine and Beacon systems, tends to emphasize consonant boundaries of words and syllables -- an often overlooked concept in discussions of vowel spellings.

c. Systematic dialectal variations are accepted because everyone speaks an idiolect; e.g., some speakers tend to diphthongize the vowel, as in *bed*.

d. Word-perception skills can be more effectively developed and applied when the readability of the material is at the learner's instructional level.

e. On-the-spot help is most effective when the learner identifies the *part* of the word (e.g., *ea* in *each* or *ea* in *neanderthal*) on which help is needed, and receives help on that part followed by the learner's closure. (A corollary: need, awareness of success, and other facets of motivation are central to word-perception learning.)

f. The sequence of phonics instruction depends on the vocabulary of the reading material and, equally important, on the specific needs of the learner.

7. Basic readers based on phonics have fallen into disrepute since the last series was published in the late 1920's; e.g., Moore-Wilson Readers.

8. Word perception is terminated with cognitive closure -- arriving at the meaning which includes linguistic and referential.

a. Content words (e.g., call, duck) have referential meaning.

b. Function words (e.g., and, of, when) have linguistic meaning.

c. An overemphasis on phonics tends to reduce semantic and linguistic input, producing word callers and word-by-word reading.

d. An underemphasis on phonics contributes to failure in learning the "alphabetic principle".

e. The relationship between words and their meanings is precarious; e.g., a word may have different denotations and connotations.

9. The reading establishment has been frustrated by the ineffectiveness of phonics but has failed to consider prerequisite, relevant concepts in educational psychology and linguistics (phonemics and grammer) for a laboratory-demonstration course on reading instruction.

10. As a corollary to 9, above, the reading establistment has failed to consider the complex and complicated nature of orthography (spellings and irregular spellings) that represent speech -- to take a second look at initial teaching alphabets, not i.t.a. alone, and/or special "self-help" with modified dictionary respellings without diacritical markings.

a. Use of different capital and "small" (lowercase) letters -- e.g., G-g, H-h, B-g -- introduces unnecessary confusion for beginners in reading, but has a pragmatic, immediate solution.

b. In T.O. (traditional or conventional) letters are represented by more than one basic shape, as capitals and lower case, manuscript and cursive, as bold face and italics, ligatures (e.g., ﬁ, ﬂ).

c. For many reasons, basic research is needed to assess the relationships between a controlled (revised to achieve regularity) orthography and word perception in the ongoing reading processes.

d. An initial teaching alphabet (e.g., i.t.a. or W.E.S.) is a *medium* rather than a method for teaching reading.

e. Research on an initial teaching alphabet probably merits priority over genuine spelling reform.

f. Systematic spellings for beginners in reading permit:

  (1) Prediction of pronunciation: e.g., *one* vs *wun*, *was* vs. *wuz*

  (2) Learning by analogy; e.g., *hav* vs. *have*

11. Preparation for beginning reading includes visual discrimination of geometric forms called letters, visual-motor skills, auditory discrimination and perception, awareness of speech-sounds and spoken words, general alertness to the relationship between speech and writing, and so on.

12. Corrective reading and sometime remedial reading are euphemisms for the failure of first teaching.

  a. A retarded reader with inadequate word-perception skills is likely to be a "poor" speller.

  b. A "poor" speller with a "good ear" for speech sounds is likely to spell words the way they sound; e.g., wuz for was.

13. Many practices in teaching phonics frustrate the learner, especially the beginner, and produce confusion and retardation; e.g., listening for the sound /b/ in _climb_, attempting to say consonant sounds in isolation, and so on.

14. Preparation for the perceptual-cognitive facet of reading (decoding at phonological, grammatical, and semantic levels) requires a mosaic of competencies and performances.

a. Competence in producing and understanding sentences, or language facility.

b. Speech production, e.g., sound /y/ in yellow, /sh/ in shoe, /v/ in violet (Long ago, Leonard Bloomfield commented: "He can be taught to read only after phonemic habits are thoroughly established." p.501)

c. A lexicon, reflecting a basic stock of concepts from a background of information (Concepts yield vocabulary, not vice versa)

d. Skill in visual discrimination of letters and word forms

e. Ability to name letters of the alphabet, as an awareness of writing

f. Visual-motor skills for reproducing geometric forms, including letters (E.g., ability to copy an outline of a square and horizontal diamond and to copy letters A and H)

g. Ability to perceive relationships in a block design; e.g., copying the correct colors in an alternating black and white, vertically and horizontally, design.

h. Awareness of spoken words (This is easily taught quickly and effectively in groups via categories; e.g., colors, furniture, names)

i. Awareness of speech sounds, especially vowels (This awareness is quickly learned; e.g., hearing /ē/ in he, /ō/ in home, /ü/ in zoo)

j. Visual skills required for singleness and clearness at both reading and blackboard distances.

k. Skill in color discrimination and knowledge of color names (e.g., red, green, blue, yellow)

l. Hearing, e.g., repeating whispered numbers

m. Ability to do analogical reasoning, e.g., to perceive relationships between pairs of relevant words, as sky-blue, grass-green

n. Ability to contrast ideas; e.g., to recall opposites as big-little

o. Ability to classify (categorize) ideas: i.e., to abstract (E.g., how are a kitten and a puppy alike?)

p. Interests, measured by "What I do"

q. Memory span, a test of attention

r. Motivation, reflected in ability to write own name, requests for listening to self-selected articles in an encyclopedia (e.g., facts on tigers), knowledge of children's literature, requests for "what is this word?", browsing in picture and other books, and so on (This self-actuated behavior reveals facets of motivation: knowledge, skills, values, intent, awareness of success, interest, personal needs, aspirations, attitudes, and so on)

15. Syllable phonics is deceptive -- complex and complicated.

a. The concept of a syllable is somewhat ephemeral, with syllable boundaries in question because there is no exact point of syllable division.

b. The dictionary respelling,not the vocabulary entry, is one basis for determining syllable boundaries; e.g., for using kinaesthetic or tactile techniques and other syllabication activities; e.g.,

Entry	Respelling
an·ger	/'ang-ger/
busi·ness	/'biz-nəs/
but·ter	/'bət-ər/
fas·ten	/'fas-n/
freez·er	/'frē-zər/
mo·tor	/'mōt-ər/

(1) Syllable division in vocabulary entry indicates how syllables are divided in writing.

(2) Syllable division in respelling indicates a phonological "fact" of pronunciation.

(Note: The rationale of syllable division is explained in Webster's New International Dictionary)

c. Polysyllabic words may be analyzed phonologically, morphologically, typographically, or visually depending upon the principle used.

d. Syllabication rules "taught" by educationists usually are contradictory and confusing -- linguistically and orthographically paradoxical.

e. Syllabication involves special situations

(1) Two adjacent vowels; two syllables. e.g., *giant*.

(2) Writing vs. speaking; e.g., *garden* gar•den /'gard-n/ (See *b* above)

(3) Words ending in *ed* as *needed* vs *asked* (*voiceless* consonant) and *dreamed* (*voiced* consonant)

(4) Variable syllabication, as *crooked* /'krùk-əd/ and /'krùkt/

(5) Vowel sound in final syllable
  (a) Primary stress, as in *relate*
  (b) Secondary stress, as in *divide*
  (c) Weak stress, as in *package*

(6) ng or nk

(a) /ng-g/ in anger, longer

(b) /ng/ in sung, strong

(c) /ngk/ in bank, sink

(d) /nj/ in orange, range

(7) x

(a) /ks/ in box, excuse

(b) /k-s/ in except, excell

(c) /g-z/ in exact, exam

(d) /k-sh/ in luxury

(e) /g-zh/ in anxious

(8) Syllabic consonants, as in cattle /'kat-l/, open /'ō-pən, ōp-n/, eaten /'ēt-n/

f. The rule that there are as many syllables in a word as there are vowel "places" has hazards, as in fate-affectionate, moaned, giant, prison.

Vowel Rules/Spelling Patterns

Two classic studies on sound-spelling relationships were reported in 1950 by Ruth Oaks on vowel situations and by Elsie Black on consonant situations. These investigations, based on the Betts Basic Vocabulary Studies, reported the application/exception ratios for time-honored vowel and consonant "rules". Unfortunately, some of the rules don't give the beginners in reading a gambler's chance in their application. Yet those mythnomers continue to be quoted in so-called professional literature more than a quarter of a century later.

At this point, findings from the above studies are summarized and reported on selected vowel rules which have been renamed spelling patterns.

Spelling-Pattern I or "Short" Vowel Rule

(Consonant)-Vowel-Consonant, or (C)VC pattern of monosyllables, as in *at*-*bad*-*back*, *it*-*big*-*bill*, *get*-*bed*-*bell*, *cot*-*fog*, *but*-*cup*, *spin*-*test*-*then*.

Exceptions: *was*, *old*, *want*, *find*, *right*, *wild*, *sign*, *put*, *star*-*her*-*bird*-*fur*, *walk*, *all*, *saw*, *haul*. (For each of these exceptions, a rule is available!)

In the Ruth Oaks' classic study, based on the *Betts Reading Vocabulary Studies*, this "short" vowel rule had an application/exception ratio of 71/29 for beginning readers.

Two other application/exception studies were made by the author and presented in "Phonics: Methods and Orthography," *Spelling Progress Bulletin*, Part I, Vol. XIV, No. 1, (Spring 1974), pp. 2-6; Part II, Vol. XIV, No. 2, (Summer 1974), pp. 7-12. Analyses were made of:

1. Edgar Dale - "A comparison of two word lists"
2. A series of basic readers, preprimers to first reader, inclusive

(These data also apply to other phonic rules listed below.)

The rule for "short" vowels is stated in various ways, loaded with concepts often technical, sometimes awkward, and frequently hedged by qualifiers, as *usually*:

1. *Vowels* are usually "*short*" in *closed syllables*, e.g., *cat*.

2. *Vowels* are usually "*short*" when modified by *position*; e.g., *cap*, *clap*.

3. If there is only one vowel in a word or syllable and it is followed by a consonant, the vowel is usually "short."

4. One vowel in the middle of a word usually has its short sound.

5. When a syllable ends in a consonant, its vowel is usually "short."

6. When there is only one vowel in a stressed syllable and that vowel is followed by a consonant, the vowel has its "short" sound.

7. A single vowel in a closed accented syllable has its "short" sound unless it is influenced by some other sound in the syllable. The consonants that most frequently affect the vowel sounds in the syllable are *r*, *l*, *w*.

8. A stressed vowel, followed by one or more consonants in the same syllable is usually "short."

9. When there is only one vowel in a one-syllable word and it isn't at the end, it is usually "short."

10. When a vowel is one of two middle letters in a word of four letters, the vowel is "short"; e.g., buzz.

11. When a vowel is within a word of more than four letters, the vowel is "short"; e.g., scratch.

12. An initial or medial vowel in a word or syllable usually has the short sound when it is the only vowel in a word.

Exceptions to the short vowel rule are made into rules:

1. When a follows w in a word, it usually has the sound of a in was. (The author gave watch as an example of application! The word watch is respelled /'wäch/ but was is respelled /'wəz/. Hence, the author's confusion is showing. To finalize the confusion the author gave swam /swam/ as an exception!)

2. When e is followed by w, the vowel sound is the same as represented by oo. (Which oo? The oo in look or the oo in moon?)

3. The letter a has the same sound when followed by l, w, and u. (We assume all, saw, caught are examples of the /ȯ/ sound.)

Notes:

1. In G & C Merriam's Websters New Elementary Dictionary plain a /a/, e /e/, i /i/, two dot a /ä/, and schwa /ə/ have been substituted for the breve diacritical marking, as in /kăt/, /ĕnd/, /hĭt/, /nŏt/, /cŭt/.

2. In English, the "short" vowel sounds predominate. See Godfrey Dewey, Relativ Frequency of English Speech Sounds.

3. In phonology, the terms short and long denote duration of a speech sound in its speech environment; e.g., the vowel sound in glad tends to be longer than the vowel sound in late -- giving the myth to statements of phonic zealots.

4. One author, in fact, stated emphatically that when teaching the short vowel rule for cat and stand, "Emphasize the sound of a (ah), but not detach the sound." This statement, of course, is a double or maybe a triple whammy.

First, the sound /a/ is not respelled ah, for the sound /ä/ is sometimes called the ah sound by phoneticians.

Second, how is the sound /a/ emphasized without distortion?

Third, "do not detach the sound" from what? One or both consonant boundaries?

Spelling-Pattern II, or Final e (Split digraph) Rule

(C onsonant)-Vowel-Consonant plus final e, or (C)VCe pattern of monosyllables, as in make-like-joke -duke.

Exceptions: come, some, gone, done, one, have, give, move, are, here, were, use, more, shore, horse, prince.

In the Oaks study, this final e vowel rule had an application/exception ratio of 53/47 in beginning readers.

The rule for the split digraph -- which the learner has about a 50-50 chance of using effectively -- is stated in these fashions, with varying complexities:

1. In a short word ending with a final e, the e is usually silent and the "preceding" [sic] vowel is "long," or "says its own name."

2. Final e lengthens the "preceding" [sic] vowel.

3. The letter e at the end of an accented syllable usually shows that the preceding vowel has its "long" sound.

4. When there are two vowels [sic] in words of one syllable, usually the first is "long" and the second is silent.

5. A stressed vowel, followed by a consonant and silent e is usually "long."

6. When a stressed syllable ends in e, the first [sic] vowel in a syllable has its own long sound and the final e is silent.

7. When e comes at the end of a word, it doesn't sound (it is silent), and the a has the long sound. (This sub-rule is restated for e, i, o, u.)

8. Final e in a word or syllable signals a "long" vowel and the /s/ sound for c as in place, face, piece, palace.

9. Final e in a word or syllable signals a "long" vowel and the /j/ sound of g, as in age, large, hinge, orange.

Spelling-Pattern III, Vowel Digraph

(C onsonant)-Vowel-Vowel-Consonant as in beat-feed, rain-wait, eat-read /rēd/, street. (See below)

Exceptions: field-great, been,

was-said; built, good-moon, hair-dear, heard, sn(ow), read (past tense /red/)

In the Oaks study, the vowel digraph "rule" had an application/exception ratio of 50/50 in beginning readers.

The rule for vowel digraphs, often dutifully hedged, also is stated in various ways:

1. When two vowels [sic, sounds or letters?] of a word are together, the first "vowel" [sic] is *usually* "long" and the second vowel [sic] is silent.

2. In vowel digraphs, the first vowel [sic] *usually* has its own "long" sound and the second vowel [sic] is silent.

3. In *most* vowel digraphs the first vowel has its own "long" sound and the second is silent.

4. When there are two vowels, one of which is final *e*, the first vowel is long and the *e* is silent.

5. When there are two *adjacent* vowels in a syllable, the first vowel has its own "long" sound and the second is silent.

6. A combination of two vowels [letters or sounds?] in a word is called a vowel digraph. Usually the first vowel [sic] is long and the second is silent.

Exceptions to the vowel digraph rule are stated as rules:

1. If two o's appear in a word or syllable, they have the short sound of oo as in book and the long oo as in moon.

2. Words having the double e usually have the long e sound. (E.g., seem; exception been)

3. In the phonogram ie, the i is silent and the e has a long sound. (E.g., believe; exception friend)

Other Spelling Patterns: Vowels

There are more than fifty phonic "rules". Some attempt to justify exceptions to the above three spelling patterns by stating rules for sub-patterns.

A few examples follow:

1. Final vowel letters

   a. A final vowel (a,e,i,o,u) usually has its long sound when it is the only vowel in a word; e.g., me, go, or in a syllable (o)pen, (ta)ken.

   b. A final i or y in a word or syllable may either have the "long" i sound; e.g., (fi)nal, my or have the "short" i sound; e.g., division, city, baby.

   c. When a syllable contains only the one vowel a, followed by the letters l or w, the sound for a rhymes with the word saw; e.g., ball, paw.

   d. A single "vowel" [letters?] followed by r in a word or syllable has neither its long nor its short sound, but is modified [sic] and controlled [sic] by the consonant [sic] r; e.g., her-bird-fur-word (The er-ir-ur-or represent one phoneme), arm-farm-corn.

2. Letter _y_

a. When _y_ is the final letter is a word, it usually has _a_ vowel sound; e.g., _why_, _dry_.

b. When _y_ is used within a word, it usually has the sound of long _i_; e.g., _scythe_, _type_, _dye_. Exception: _myth_, _myrtle_

Consonant Rules

Our study of these rules is presented in a subsequent publication.

Syllabication Rules

Our study of syllabication rules and spelling rules is presented in a subsequent publication.

Rules: In Summary

Vowel rules are not necessarily the answer to a beginner's prayer.

1. Rules tend to bog down the young learner with a spate of concepts: digraphs, vowels, consonants, long and short vowels, initial vowel, medial vowel, syllables, closed syllable, open syllable, accent (stress), etc.

2. Memorizing vowel rules is probably as ineffective as memorizing long lists of sight words.

3. The application/exception ratios for some rules are so low they become sources of confusion rather than education.

4. Some authors confuse terminology; e.g., mixing digraphs (spellings) and diphthongs (sounds), using the indefinite term vowel for both sounds and spellings.

5. Some authors use ambiguous terminology; e.g., failing to identify the referent as sound or letters (phonogram) in "when there are two vowels in words of one syllable, usually the first is 'long' and the second is silent." What is a silent vowel? What are the two vowels in the word made?

6. To recognize exceptions to the rule, hedges are used: "*usually*", "unless it is influenced by some other sound in the syllable", "most".

When these precautions are not taken, teachers and pupils are given a sense of *false* security, as in

"... the first vowel *has* its own 'long sound' and the second *is* silent." That is, unfavorable application/exception ratios are obscured.

7. The purpose of an i.l.m. (initial teaching medium) is to reduce the complexity of phonic rules via a closer fit between phonemes and spellings.

Learning Letter Names

The following statements appear to be valid:

1. Ability to read letters and numbers appears to be one of the best single predictors of achievement in beginning reading, but the causal relationship remains unestablished.

2. To date, there is no real evidence that teaching pupils to read letters and numbers prior to beginning reading facilitates learning to read. In fact, there is evidence to indicate that learning letter names interferes with subsequent associative learning of words and pictured objects. Furthermore, there is an increasing fund of evidence that practice on letter identification is not significantly related to later achievement in beginning reading.

3. There is evidence that learning the names of geometric forms (e.g., circle, square, triangle) facilitates distinguishing between them. By analogy, it is possible but not necessarily probably, that learning the names of letter shapes facilitates letter discrimination. (See 4, below)

4. There is no one-to-one correspondence between letter names and the sounds represented by letters; e.g., the letter name *b* /'bē/ and the sound represented by *b* in *by* /'bī/, or the letter name *y* /'wī/ and the sound represented by *y* in *year* /'yir/ or the letter name *u* /'yü/ and the stressed sound represented by *u* in *but* / 'bət/ or the unstressed sound represented by *a* in *again* (ə-'gen). In fact, learning the *names* of letters by whatever means tends to interfere with learning *grapheme-phoneme* relationships.

Word Perception: Imagery

Imagery has been studied from two points of view: first, in terms of visualizations in reading poetry, prose, and other genre--cognitive functions; second, in terms of memory images--word perception. This discussion deals primarily with imagery in perception.

Hume is credited with introducing the concept of imagery in psychology in 1748. In 1897, Tichener listed the elements of images, differentiating them from sensation, as being unclear, of less intensity, and brief duration.

In 1925, E. Jaensch reported on eidetic imagery as having the characteristic features of actual sensation. He cited these unusual[1] vivid images as being relatively common among children, but rare among adults. His book on Eidetic Imagery and Topological Methods of Investigation was published in 1930.

Imagery--a somewhat esoteric concept in psychology--has been born anew. The subject also was investigated rigorously by Goldscheider and Müller in 1893, by J. Zeitler in 1900, and by others. During the late 1800's, studies were reported by G.M. Stout, Ribot, William James, and others--usually with the conclusion that the role of images in consciousness was overestimated.

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In his The Psychology and Pedagogy of Reading, 1908, Edmund Burke Huey summarized these studies--with emphasis on the images of words. In his Deficiencies in Reading Ability, 1922, Clarence Truman Gray presented a chapter on "Imagery and Apperception as Involved in the Reading Process." He was particularly concerned with the role of imagery in mental life, emphasizing the "highly complex system of imagery" and concrete imagery which "may be so abbreviated that it would not stand in the way of a very rapid rate." (p.228) His chief complaint: "Imagery has had little or no attention paid to it in its connection with reading." That there has been a renaissance of interest in imagery cannot be gainsaid; in the March 1976 issue of Psychological Abstracts, for example, 18 doctoral dissertations on this topic were reported.

Imagery has been omitted from the National Society for the Study of Education yearbooks on reading, child development, and linguistics. However, there is one exception: imaging is discussed in Media and Symbols: The Forms of Expression, Communication, and Education (1974, Part I). But these discussions were limited to conceptual imaging via visual aids.

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In the older literature on word perception and on spelling, this admonition is stated: "Strong appeal should be made to visual imagery in presenting a word." This advice is usually followed by the suggestion that (1) the learner see the word as a whole and (2) systematically examine the *word form*. This visual imagery is reinforced by (1) auditory imagery (i.e., *hearing* the word pronounced), (2) speech imagery (i.e., pronouncing the word), (3) hand-motor imagery (i.e., writing the word).

One of the key concepts in the above paragraph is the examination of the word form. In spelling, this is done by grouping into syllables. But *syllables* is a somewhat ubiquitous term unless the *pronunciations* in the dictionary are converted into spellings of syllables.

A second key notion in the above paragraph is that different types of imagery reinforce visualization. Auditory imagery, for example, appears to be superior to visual imagery. But how is reinforcement of visual imagery achieved in word perception?

In her *Remedial Techniques in Basic School Subjects*, 1943, Grace M. Fernald emphasized the "image of the word" in her visual-auditory-kinaesthetic-tactile techniques for teaching word perception and spelling. In fact, she made use of imagery tests to estimate potencies of different types of

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imagery--visual-auditory-motor--used by different individuals. One of the chief purposes of her technique was to develop imagery.

Concepts and Terminology

Over the years, writers on the psychology of reading have used the terms *mnemonic devices*, *sensorial imagery*, *memory*, *memory storage*, *memory images*, *after images*, *eidetic images*, *reproductive images*, *verbal images*, *affective imagery*, *anticipatory images*, *spatial images*, *auditory* and *motor elements* of visual imagery, *imaganeering*, *image isomorphs*, *imagery values*, *structural visualization* (graphics), *visualization*, *retinal images*, *composite images*, *mnestic* (memory) *processes*, and *trace strength*. Terminology varies from neo-behaviorists to other theorists.

Imaging: Tentative Conclusions

In the somewhat extensive literature on imagery, the following statements appear to merit consideration:

1. An image is an object or an event (e.g., a word, phrase, or sentence) which an individual "sees" in his mind or otherwise "perceives" without the object or event being present.

2. Imagery is an extremely complex, active process.

3. At higher levels of mental organization, the image is differentiated from the percept.

4. Imagery is considered to be a component of symbolic processes, including perception.

5. The efficacy of imagery has been demonstrated in the psychological laboratories and outside.

6. According to Vigotsky, in writing, the child "must disengage himself from the sensory aspects of speech and replace words by images of words ." (Italics mine)

7. Image theories have not demonstrated a satisfactory explanation of the relation between symbol and meaning.

8. Primary memory permits an individual to hear seven or eight digits and to report them immediately.

9. Significant differences in imagery among individuals are well known; some individuals exhibiting exceptional photographic memory images, called eidetic images. That is, imageability is an important variable.

10. Eidetic images are equated with percepts; that is, the eidetic images may be fused with their percepts--visual, and other sensory inputs. That is, eidetic images are more than after images.

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11. Eidetic imagery appears to be prevalent among some children, and. / less common among adults.

12. In paired-associate learning, imagery value of words appears to be enhanced by concreteness versus abstractness. (Content vs function words?) That is, concrete words (high-imagery-words) are superior to abstract words (low-imagery words) in studies of imaging.

13. Drill on classified words develops a set for phonogram invariance. But in reading, the learner is confronted with diversity, or variance, possibly, or probably, interfering with storage in memory and retrieval and requiring a search and decision process.

14. In certain types of imaging, as related to memory tasks, stereoscopic vision at a reasonably high level appears to be a requisite.

15. There is some evidence that the image codes the word; that is, a learner can substitute (convert) a mental image for the word.

16. The development of images may facilitate memory via interplay with percepts.

17. Chunking processes (i.e., grouping pronounceable parts of words in various ways) in memory may play a role in imaging.

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These chunking, or grouping, processes operate in repeating digits and recognizing pronounceable parts of words, as consonant-vowel phonograms (e.g., *ca* in *cap*), vowel-consonant phonograms (e.g., *ap* in *cap*), and syllables (e.g., *al·pha·bet*).

18. Imagery may be a mediator in perception and re-cognition.

19. Function, or structure, words may play a role in larger contexts: phrases, sentences, or paragraphs.

20. For short-term memory, auditory presentations produce results superior to visual memory.

21. Retrieval of information from the memory store depends upon the specificity of cues available.

22. There is some evidence that words and sentences can be remembered without recourse to imagery.

Crucial Questions

1. What procedures have validity for assessing the predominant type of imagery used by different learners as a basis for instruction?

2. What techniques are efficient for developing visual imagery in word perception?
    a. Does the study of phonics facilitate or interfere with word perception and re-cognition? (E.g., what types of phonics and other word-perception activities are relevant to imagery?

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b. For whom are kinaesthetic techniques appropriate? Tactile techniques?

c. Does paired-associate (e.g., picture-word) learning facilitate imaging for "sight" words?

3. What classes of words yield imagery?

a. Content words (e.g., table, desk) versus function words (e.g., the, all)?

b. Highly abstract words (e.g., advantage, honor) versus concrete words (e.g., house, chair) ?

4. What is the role of stereoscopic vision in imaging?

5. Does imaging increase the attributes of word meaning?

a. The semantic processing, or decoding, of writing?

b. The linguistic--syntactic and morphologic--processing of writing? (Linguistic factors propbably have limited importance in dealing with single words.)

6. Are words stored in memory as visual images? (Objects symbolized by nouns? Words as symbols of events?)

7. What is the effect on imaging of regularized spellings, especially in beginning reading? That is, do heterographic spellings interfere with imaging?

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8. What assessment procedures are valid as a basis for prescribing activities to facilitate imaging?

9. What factors in word perception contribute to effective imaging? (E.g., meaning, need, intent to learn, perceptual and cognitive closure, graphotactics, contrast, feedback, feed forward, perceptual match and mis-match, analogy, attention, concentration, perceptual and learning sets, mediation, invariance of stimuli, reinforcement, and so on.)

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In Conclusion

This session on phonics and spelling can lead educators to grasp the truth of the REALITY of the situation in word perception. True, English writing is an alphabetic system, but this truth does NOT lead to the conclusion that the fit between speech sounds and spellings is a close fit, or even remotely close, for some phonograms and phonic rules. True, that this need to legitimatize phonics instruction via direct attention to the spelling system as well as to the psycholinguistic basis of word perception has long been recognized by the world's best scholars--that this need persists and will not go away. True, that the recrudescence of diverse phonic methods and the relentless, unfruitful, nugatory pursuit of phonics is diversionary--away from the central problem, the spelling system.

True, that immediate, common-sense steps can be taken to alleviate the beginning learner's frustration (perceptual conflicts from heterographic spellings) with his attempts to recode writing into speech. But this fact remains: this session will be productive and can have solid, long-lasting impact when everyone here returns to his or her acres of diamonds with the conviction--the involvement and, more important, the commitment--to pursue requisite multi-disciplinary scholarship that leads to research on the central problem--the medium, or spelling system.

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